Claims

1. A valve comprising:

a valve body having a bonnet receiving region and at least one flow channel; and

a bonnet comprising a valve stem and a translator, at least a portion of said bonnet being positioned within said bonnet receiving region,

said valve stem having a valve stem axis and being rotatable about said valve stem axis, said valve stem having valve stem threads on a valve stem threaded region,

said translator having translator threads on a translator threaded region,

said valve stem threads being threaded on said translator threads so that said translator can be moved from a first position to a second position by clockwise rotation of said valve stem about said valve stem axis, and said translator can be moved from said second position to said first position by counter-clockwise rotation of said valve stem about said valve stem axis, said first position being spaced from said second position in a translator motion direction which is co-linear with or substantially co-linear with said valve stem axis, at least a portion of said translator protruding into said flow channel when said translator is in at least one of said first position and said second position,

whereby said translator can be positioned at a translator position selected from among said first position, said second position, or positions along said translator motion direction between said first position and said second position, such that flow through said flow channel is affected by said translator position,

at least said translator threads having a coefficient of thermal expansion which is substantially similar to a coefficient of thermal expansion of said valve stem threads.

2. A valve as recited in claim 1, wherein at least said translator threads and said valve stem threads are formed of the same material.

3. A valve as recited in claim 2, wherein at least said translator and said valve stem are formed of the same material.

4. A valve as recited in claim 1, further comprising a seal which prevents or inhibits fluid from said flow channel from escaping between said bonnet and said valve body.

5. A valve as recited in claim 4, wherein said seal comprises first and second annular members and packing, said first and second annular members being positioned radially between said valve stem and said valve body, said first and second annular members being substantially coaxial with said valve stem, said packing being positioned axially between said first and second annular members and radially between said valve stem and said valve body.

6. A valve as recited in claim 1, further comprising a gland and at least one shim, said gland being engaged with said valve body, said gland being positioned radially between said valve stem and said valve body, said valve stem having at least one protuberance extending radially outward from said valve stem, said shim being positioned axially between said protuberance and said gland, said shim thereby preventing said gland from moving axially beyond said shim.

7. A valve as recited in claim 6, wherein said protuberance is a ring positioned in a circumferential groove formed in said valve stem.

8. A valve as recited in claim 1, wherein said valve stem further comprises at least one shoulder portion which extends radially from said valve stem axis farther than an adjacent portion of said valve stem, said valve stem being limited from moving in a first direction axially along said valve stem axis by said shoulder portion engaging a shoulder receiving portion of said valve body.

9. A valve comprising:

a valve body having a bonnet receiving region and at least one flow channel;

a bonnet comprising a valve stem and a translator, at least a portion of said bonnet being positioned within said bonnet receiving region, said valve stem having a valve stem axis and being rotatable about said valve stem axis, said valve stem having at least one protuberance extending radially outward from said valve stem;

at least one protrusion being provided on one of said valve stem and said valve body, which protrusion engages the other of said valve stem and said valve body so as to limit axial movement of said valve stem relative to said valve body in a first direction along said valve stem axis;

at least one gland engaged with said valve body, said gland being positioned radially outward from a portion of said valve stem; and

at least one shim positioned radially between said valve stem and said valve body, and axially between said protuberance and said gland, so as to limit axial movement of said valve stem relative to said valve body in a second direction, opposite to said first direction,

said valve stem having valve stem threads on a valve stem threaded region,

said translator having translator threads on a translator threaded region,

said valve stem threads being threaded on said translator threads so that said translator can be moved from a first position to a second position by clockwise rotation of said valve stem about said valve stem axis, and said translator can be moved from said second position to said first position by counter-clockwise rotation of said valve stem about said valve stem axis, said first position being spaced from said second position in a translator motion direction which is co-linear with or substantially co-linear with said valve stem axis, at least a portion of said translator protruding into said flow channel when said translator is in at least one of said first position and said second position,

whereby said translator can be positioned at a translator position selected from among said first position, said second position, or positions along said translator motion direction between said first position and said second position, such that flow through said flow channel is affected by said translator position.

10. A valve as recited in claim 9, further comprising a seal which prevents or inhibits fluid from said flow channel from escaping between said bonnet and said valve body.

11. A valve as recited in claim 10, wherein said seal comprises first and second annular members and packing, said first and second annular members being positioned radially between said valve stem and said valve body, said first and second annular members

being substantially coaxial with said valve stem, said packing being positioned axially between said first and second annular members and radially between said valve stem and said valve body.

12. A valve as recited in claim 9, wherein said protuberance is a ring positioned in a circumferential groove formed in said valve stem.

13. A valve as recited in claim 9, wherein said gland has external gland threads which are threaded on internal gland threads on said valve body such that said gland can be selectively rotated clockwise or counter-clockwise relative to said valve stem axis to cause said gland to be moved axially relative to said valve stem axis.

14. A valve as recited in claim 9, wherein said at least one protrusion comprises a shoulder portion on said valve stem, said shoulder portion extending radially from said valve stem axis farther than an adjacent portion of said valve stem, said valve stem being limited from moving in said first direction axially along said valve stem axis by said shoulder portion engaging a shoulder receiving portion of said valve body.

15. A power generating system, comprising:

at least one turbine; and

at least one combustion system, said combustion system comprising:

at least one fuel supply;

at least one combustion canister;

at least one valve, said valve comprising:

a valve body having a bonnet receiving region and at least one flow channel; and

a bonnet comprising a valve stem and a translator, at least a portion of said bonnet being positioned within said bonnet receiving region; and

at least one fuel conduit communicating between said fuel supply and said combustion canister through said flow channel,

said valve stem having a valve stem axis and being rotatable about said valve stem

axis, said valve stem having valve stem threads on a valve stem threaded region,

said translator having translator threads on a translator threaded region,

said valve stem threads being threaded on said translator threads so that said translator can be moved from a first position to a second position by clockwise rotation of said valve stem about said valve stem axis, and said translator can be moved from said second position to said first position by counter-clockwise rotation of said valve stem about said valve stem axis, said first position being spaced from said second position in a translator motion direction which is co-linear with or substantially co-linear with said valve stem axis, at least a portion of said translator protruding into said flow channel when said translator is in at least one of said first position and said second position,

whereby said translator can be positioned at a translator position selected from among said first position, said second position, or positions along said translator motion direction between said first position and said second position, such that flow through said flow channel is affected by said translator position,

at least said translator threads having a coefficient of thermal expansion which is substantially similar to a coefficient of thermal expansion of said valve stem threads.

16. A power generating system as recited in claim 15, wherein at least said translator threads and said valve stem threads are formed of the same material.

17. A power generating system as recited in claim 16, wherein at least said translator and said valve stem are formed of the same material.

18. A power generating system as recited in claim 15, further comprising a seal which prevents or inhibits fluid from said flow channel from escaping between said bonnet and said valve body.

19. A power generating system as recited in claim 18, wherein said seal comprises first and second annular members and packing, said first and second annular members being positioned radially between said valve stem and said valve body, said first and second annular members being substantially coaxial with said valve stem, said packing being positioned

axially between said first and second annular members and radially between said valve stem and said valve body.

20. A power generating system as recited in claim 15, further comprising a gland and at least one shim, said gland being engaged with said valve body, said gland being positioned radially between said valve stem and said valve body, said valve stem having at least one protuberance extending radially outward from said valve stem, said shim being positioned axially between said protuberance and said gland, said shim thereby preventing said gland from moving axially beyond said shim.

21. A power generating system as recited in claim 20, wherein said protuberance is a ring positioned in a circumferential groove formed in said valve stem.

22. A power generating system as recited in claim 15, wherein said valve stem further comprises at least one shoulder portion which extends radially from said valve stem axis farther than an adjacent portion of said valve stem, said valve stem being limited from moving in a first direction axially along said valve stem axis by said shoulder portion engaging a shoulder receiving portion of said valve body.

23. A power generating system, comprising:

at least one turbine; and

at least one combustion system, said combustion system comprising:

at least one fuel supply;

at least one combustion canister;

at least one valve, said valve comprising:

a valve body having a bonnet receiving region and at least one flow channel;

a bonnet comprising a valve stem and a translator, at least a portion of said bonnet being positioned within said bonnet receiving region, said valve stem having a valve stem axis and being rotatable about said valve stem axis, said valve stem having at least one protuberance extending radially outward from said valve stem;

at least one protrusion being provided on one of said valve stem and said valve body, which protrusion engages the other of said valve stem and said valve body so as to limit axial movement of said valve stem relative to said valve body in a first direction along said valve stem axis;

at least one gland engaged with said valve body, said gland being positioned radially outward from at least a portion of said valve stem; and

at least one shim positioned radially outward from said valve stem and axially between said protuberance and said gland, so as to limit axial movement of said valve stem relative to said valve body in a second direction, opposite to said first direction; and

at least one fuel conduit communicating between said fuel supply and said combustion canister through said flow channel,

said valve stem having valve stem threads on a valve stem threaded region,

said translator having translator threads on a translator threaded region,

said valve stem threads being threaded on said translator threads so that said translator can be moved from a first position to a second position by clockwise rotation of said valve stem about said valve stem axis, and said translator can be moved from said second position to said first position by counter-clockwise rotation of said valve stem about said valve stem axis, said first position being spaced from said second position in a translator motion direction which is co-linear with or substantially co-linear with said valve stem axis, at least a portion of said translator protruding into said flow channel when said translator is in at least one of said first position and said second position,

whereby said translator can be positioned at a translator position selected from among said first position, said second position, or positions along said translator motion direction between said first position and said second position, such that flow through said flow channel is affected by said translator position.

24. A power generating system as recited in claim 23, further comprising a seal which prevents or inhibits fluid from said flow channel from escaping between said bonnet and said valve body.

25. A power generating system as recited in claim 24, wherein said seal comprises first and second annular members and packing, said first and second annular members being positioned radially between said valve stem and said valve body, said first and second annular members being substantially coaxial with said valve stem, said packing being positioned axially between said first and second annular members and radially between said valve stem and said valve body.

26. A power generating system as recited in claim 23, wherein said protuberance is a ring positioned in a circumferential groove formed in said valve stem.

27. A power generating system as recited in claim 23, wherein said gland has external gland threads which are threaded on internal gland threads on said valve body such that said gland can be selectively rotated clockwise or counter-clockwise relative to said valve stem axis to cause said gland to be moved axially relative to said valve stem axis.

28. A power generating system as recited in claim 23, wherein said at least one protrusion comprises a shoulder portion on said valve stem, said shoulder portion extending radially from said valve stem axis farther than an adjacent portion of said valve stem, said valve stem being limited from moving in said first direction axially along said valve stem axis by said shoulder portion engaging a shoulder receiving portion of said valve body.

29. A valve comprising:

a valve body having a bonnet receiving region and at least one flow channel;

a bonnet comprising a valve stem and a translator, at least a portion of said bonnet being positioned within said bonnet receiving region, said valve stem having a valve stem axis and being rotatable about said valve stem axis;

first and second annular members, said first and second annular members being positioned radially between said valve stem and said valve body, said first and second annular members being substantially coaxial with said valve stem;

packing positioned axially between said first and second annular members and radially between said valve stem and said valve body; and

a gland positioned radially between said valve stem and said valve body, said gland having external gland threads which are threaded on internal gland threads on said valve body such that said gland can be selectively rotated clockwise or counter-clockwise relative to said valve stem axis to cause said gland to be moved axially relative to said valve stem axis selectively to increase or decrease a distance between said first and second annular members and thereby selectively decrease or increase pressure applied to said packing,

at least one protrusion being provided on one of said valve stem and said valve body, which protrusion engages the other of said valve stem and said valve body so as to limit axial movement of said valve stem relative to said valve body along said valve stem axis,

said valve stem having valve stem threads on a valve stem threaded region,

said translator having translator threads on a translator threaded region,

said valve stem threads being threaded on said translator threads so that said translator can be moved from a first position to a second position by clockwise rotation of said valve stem about said valve stem axis, and said translator can be moved from said second position to said first position by counter-clockwise rotation of said valve stem about said valve stem axis, said first position being spaced from said second position in a translator motion direction which is co-linear with or substantially co-linear with said valve stem axis, at least a portion of said translator protruding into said flow channel when said translator is in at least one of said first position and said second position,

whereby said translator can be positioned at a translator position selected from among said first position, said second position, or positions along said translator motion direction between said first position and said second position, such that flow through said flow channel is affected by said translator position,

at least said translator threads having a coefficient of thermal expansion which is substantially similar to a coefficient of thermal expansion of said valve stem threads.

30. A valve as recited in claim 29, wherein at least said translator threads and said valve stem threads are formed of the same material.

31. A valve as recited in claim 30, wherein at least said translator and said valve stem are formed of the same material.

32. A valve as recited in claim 29, further comprising at least one shim, said valve stem having at least one protuberance extending radially outward from said valve stem, said shim being positioned axially between said protuberance and said gland, said shim thereby preventing said gland from moving axially beyond said shim.

33. A valve as recited in claim 32, wherein said protuberance is a ring positioned in a circumferential groove formed in said valve stem.

34. A valve as recited in claim 29, wherein said at least one protrusion comprises a shoulder portion on said valve stem, said shoulder portion extending radially from said valve stem axis farther than an adjacent portion of said valve stem, said valve stem being limited from moving in said first direction axially along said valve stem axis by said shoulder portion engaging a shoulder receiving portion of said valve body.

35. A valve comprising:

a valve body having a bonnet receiving region and at least one flow channel;

a bonnet comprising a valve stem and a translator, at least a portion of said bonnet being positioned within said bonnet receiving region, said valve stem having a valve stem axis and being rotatable about said valve stem axis, said valve stem having at least one protuberance extending radially outward from said valve stem;

at least one protrusion being provided on one of said valve stem and said valve body, which protrusion engages the other of said valve stem and said valve body so as to limit axial movement of said valve stem relative to said valve body in a first direction along said valve stem axis;

first and second annular members, said first and second annular members being positioned radially between said valve stem and said valve body, said first and second annular members being substantially coaxial with said valve stem;

packing positioned axially between said first and second annular members and radially between said valve stem and said valve body;

at least one gland positioned radially between said valve stem and said valve

body, said packing gland having external gland threads which are threaded on internal gland threads on said valve body such that said packing gland can be selectively rotated clockwise or counter-clockwise relative to said valve stem axis to cause said packing gland to be moved axially relative to said valve body along said valve stem axis selectively to increase or decrease a distance between said first and second annular members and thereby selectively decrease or increase pressure applied to said packing; and

at least one shim positioned radially between said valve stem and said valve body, and axially between said protuberance and said gland, so as to limit axial movement of said valve stem relative to said valve body in a second direction, opposite to said first direction,

said valve stem having valve stem threads on a valve stem threaded region,

said translator having translator threads on a translator threaded region,

said valve stem threads being threaded on said translator threads so that said translator can be moved from a first position to a second position by clockwise rotation of said valve stem about said valve stem axis, and said translator can be moved from said second position to said first position by counter-clockwise rotation of said valve stem about said valve stem axis, said first position being spaced from said second position in a translator motion direction which is co-linear with or substantially co-linear with said valve stem axis, at least a portion of said translator protruding into said flow channel when said translator is in at least one of said first position and said second position,

whereby said translator can be positioned at a translator position selected from among said first position, said second position, or positions along said translator motion direction between said first position and said second position, such that flow through said flow channel is affected by said translator position.

36. A valve as recited in claim 35, wherein said protuberance is a ring positioned in a circumferential groove formed in said valve stem.

37. A valve as recited in claim 35, wherein said at least one protrusion comprises a shoulder element attached to an end of said valve stem, said shoulder element comprising at least one shoulder portion which extends radially from said valve stem axis farther than an

adjacent portion of said valve stem, said valve stem being limited from moving in said first direction axially along said valve stem axis by said shoulder portion engaging a shoulder receiving portion of said valve body.

38. A power generating system, comprising:

at least one turbine; and

at least one combustion system, said combustion system comprising:

at least one fuel supply;

at least one combustion canister;

at least one valve, said valve comprising:

a valve body having a bonnet receiving region and at least one flow channel;

a bonnet comprising a valve stem and a translator, at least a portion of said bonnet being positioned within said bonnet receiving region, said valve stem having a valve stem axis and being rotatable about said valve stem axis;

first and second annular members, said first and second annular members being positioned radially between said valve stem and said valve body, said first and second annular members being substantially coaxial with said valve stem;

packing positioned axially between said first and second annular members and radially between said valve stem and said valve body; and

a gland positioned radially between said valve stem and said valve body, said gland having external gland threads which are threaded on internal gland threads on said valve body such that said gland can be selectively rotated clockwise or counter-clockwise relative to said valve stem axis to cause said gland to be moved axially relative to said valve stem axis selectively to increase or decrease a distance between said first and second annular members and thereby selectively decrease or increase pressure applied to said packing; and

at least one fuel conduit communicating between said fuel supply and said combustion canister through said flow channel,

at least one protrusion being provided on one of said valve stem and said valve body, which protrusion engages the other of said valve stem and said valve body so as to limit axial

movement of said valve stem relative to said valve body along said valve stem axis,

said valve stem having valve stem threads on a valve stem threaded region,

said translator having translator threads on a translator threaded region,

said valve stem threads being threaded on said translator threads so that said translator can be moved from a first position to a second position by clockwise rotation of said valve stem about said valve stem axis, and said translator can be moved from said second position to said first position by counter-clockwise rotation of said valve stem about said valve stem axis, said first position being spaced from said second position in a translator motion direction which is co-linear with or substantially co-linear with said valve stem axis, at least a portion of said translator protruding into said flow channel when said translator is in at least one of said first position and said second position,

whereby said translator can be positioned at a translator position selected from among said first position, said second position, or positions along said translator motion direction between said first position and said second position, such that flow through said flow channel is affected by said translator position,

at least said translator threads having a coefficient of thermal expansion which is substantially similar to a coefficient of thermal expansion of said valve stem threads.

39. A power generating system as recited in claim 38, wherein at least said translator threads and said valve stem threads are formed of the same material.

40. A power generating system as recited in claim 39, wherein at least said translator and said valve stem are formed of the same material.

41. A power generating system as recited in claim 38, further comprising at least one shim, said valve stem having at least one protuberance extending radially outward from said valve stem, said shim being positioned axially between said protuberance and said gland, said shim thereby preventing said gland from moving axially beyond said shim.

42. A power generating system as recited in claim 41, wherein said protuberance is a ring positioned in a circumferential groove formed in said valve stem.

43. A power generating system as recited in claim 38, wherein said at least one protrusion comprises a shoulder portion on said valve stem, said shoulder portion extending radially from said valve stem axis farther than an adjacent portion of said valve stem, said valve stem being limited from moving in said first direction axially along said valve stem axis by said shoulder portion engaging a shoulder receiving portion of said valve body.

44. A power generating system, comprising:

at least one turbine; and

at least one combustion system, said combustion system comprising:

at least one fuel supply;

at least one combustion canister;

at least one valve, said valve comprising:

a valve body having a bonnet receiving region and at least one flow channel;

a bonnet comprising a valve stem and a translator, at least a portion of said bonnet being positioned within said bonnet receiving region, said valve stem having a valve stem axis and being rotatable about said valve stem axis, said valve stem having at least one protuberance extending radially outward from said valve stem;

at least one protrusion being provided on one of said valve stem and said valve body, which protrusion engages the other of said valve stem and said valve body so as to limit axial movement of said valve stem relative to said valve body in a first direction along said valve stem axis;

first and second annular members, said first and second annular members being positioned radially between said valve stem and said valve body, said first and second annular members being substantially coaxial with said valve stem;

packing positioned axially between said first and second annular members and radially between said valve stem and said valve body;

at least one gland positioned radially between said valve stem and said valve body, said packing gland having external gland threads which are threaded on internal gland threads on said valve body such that said packing gland can be selectively rotated clockwise or counter-clockwise relative to said valve stem axis to cause said packing

gland to be moved axially relative to said valve body along said valve stem axis selectively to increase or decrease a distance between said first and second annular members and thereby selectively decrease or increase pressure applied to said packing; and

at least one shim positioned radially between said valve stem and said valve body, and axially between said protuberance and said gland, so as to limit axial movement of said valve stem relative to said valve body in a second direction, opposite to said first direction; and

at least one fuel conduit communicating between said fuel supply and said combustion canister through said flow channel,

said valve stem having valve stem threads on a valve stem threaded region,

said translator having translator threads on a translator threaded region,

said valve stem threads being threaded on said translator threads so that said translator can be moved from a first position to a second position by clockwise rotation of said valve stem about said valve stem axis, and said translator can be moved from said second position to said first position by counter-clockwise rotation of said valve stem about said valve stem axis, said first position being spaced from said second position in a translator motion direction which is co-linear with or substantially co-linear with said valve stem axis, at least a portion of said translator protruding into said flow channel when said translator is in at least one of said first position and said second position,

whereby said translator can be positioned at a translator position selected from among said first position, said second position, or positions along said translator motion direction between said first position and said second position, such that flow through said flow channel is affected by said translator position.

45. A power generating system as recited in claim 44, wherein said protuberance is a ring positioned in a circumferential groove formed in said valve stem.

46. A power generating system as recited in claim 44, wherein said at least one protrusion comprises a shoulder element attached to an end of said valve stem, said shoulder element comprising at least one shoulder portion which extends radially from said valve stem axis farther than an adjacent portion of said valve stem, said valve stem being limited from

moving in said first direction axially along said valve stem axis by said shoulder portion engaging a shoulder receiving portion of said valve body.

47. A method of constructing a valve, comprising:

inserting at least one shim radially between a valve stem and a valve body, and axially between a protuberance and a gland, so as to limit axial movement of said valve stem relative to said valve body in a first direction along an axis of said valve stem,

said valve body having a bonnet receiving region and at least one flow channel,

said bonnet comprising said valve stem and a translator, at least a portion of said bonnet being positioned within said bonnet receiving region, said valve stem being rotatable about said axis, said protuberance extending radially outward from said valve stem,

at least one protrusion being provided on one of said valve stem and said valve body, which protrusion engages the other of said valve stem and said valve body so as to limit axial movement of said valve stem relative to said valve body in a second direction, opposite to said first direction,

said gland being engaged with said valve body and being positioned radially outward from a portion of said valve stem,

said valve stem having valve stem threads on a valve stem threaded region,

said translator having translator threads on a translator threaded region,

said valve stem threads being threaded on said translator threads so that said translator can be moved from a first position to a second position by clockwise rotation of said valve stem about said valve stem axis, and said translator can be moved from said second position to said first position by counter-clockwise rotation of said valve stem about said valve stem axis, said first position being spaced from said second position in a translator motion direction which is co-linear with or substantially co-linear with said valve stem axis, at least a portion of said translator protruding into said flow channel when said translator is in at least one of said first position and said second position,

whereby said translator can be positioned at a translator position selected from among said first position, said second position, or positions along said translator motion direction between said first position and said second position, such that flow through said flow channel is affected by said translator position.